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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/733,018	12/10/2003	Xi Shen	BYD-US2003-014	7496

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EXAMINER

CREPEAU, JONATHAN

ART UNIT PAPER NUMBER

1745

DATE MAILED: 10/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/733,018

Applicant(s)

SHEN ET AL.

Examiner

Jonathan S. Crepeau

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☒ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date: _____   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Priority***

1. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in China on 12/10/02. It is noted, however, that applicant has not filed a certified copy of the Chinese application as required by 35 U.S.C. 119(b).

### ***Claim Objections***

2. Claims 2 and 3 are objected to because of the following informalities: "um" should be "µm." Appropriate correction is required.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 3 recites that the metal powder is "80-98wt% of the additive paste, and the metal fiber is 2.0-20.0 wt% of the additive paste." However, the claim previously defines the powder and fiber as being part of the conductive paste. Correction is required.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al (U.S. Pre-Grant Publication No. 2002/0160265) in view of Ahn et al (U.S. Pre-Grant Publication No. 2002/0168574).

Hashimoto et al. teach a lithium secondary battery comprising a negative electrode having a conductive material powder which is made of the same material as the negative current collector (corresponding to the claimed "terminal") (see [0022]). In particular, the collector and the powder may both comprise copper (see [0041]). The copper powder has a mean particle diameter of 10 microns. The mixing ratio of conductive agent is 0.05-50 parts by weight with respect to 1 part by weight of active material (see [0025]). The positive electrode may have a collector comprising aluminum (see [0044]).

Hashimoto et al. do not expressly teach that the positive electrode comprises a conductive aluminum additive, as recited in claim 1.

Ahn et al. is directed to a lithium ion secondary battery. Both electrodes contain conductive additives in the form of fibers and powder (see [0025], [0026]). The fibers may comprise iron, nickel, copper, zinc, titanium, and silver, among others, and the powder may

comprise carbon. The fiber may be added in an amount of 0.1-50 wt% of electrode total weight of active materials and the powder may be added in an amount of 0.1-20 wt% of the weight of active materials (see [0031]). The ratio of powder to fiber is from 0.01:1 to 1:0.01 (see [0031]). The fiber also has a diameter of from 0.1-25 microns and an aspect ratio of about 4-2500 (see [0025]).

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the artisan would be motivated to use the conductive additives disclosed by Ahn et al in the electrodes of Hashimoto et al. In [0013] the Ahn reference teaches the following:

[0013] The present invention provides a battery comprising an electrode having conductive electron passages embedded in it, wherein the electron passages are made of fibrous materials, the conductivity of the electrode is increased greatly.

Therefore, the artisan would be motivated to use the conductive additives disclosed by Ahn et al in the electrodes of Hashimoto et al. With regard to the negative electrode of Hashimoto, the artisan would be motivated to add metal fiber, in particular copper fiber, to this electrode. With regard to the positive electrode of Hashimoto, the artisan would be motivated to add metal fibers, in particular aluminum fibers, and conductive carbon powder. As such, the subject matter of claim 1 would be rendered obvious to the skilled artisan.

7. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hashimoto et al in view of Ahn et al as applied to claim 1 above, and further in view of Gan et al (U.S. Patent 6,350,546).

The combination of Hashimoto and Ahn does not expressly teach that aluminum powder is used in the positive electrode, as recited in claims 2 and 3.

Gan et al is directed to a nonaqueous battery. In claim 15 of the reference, it is disclosed that the positive electrode may comprise a conductive additive selected from the group consisting of acetylene black, carbon black, graphite, nickel powder, aluminum powder, titanium powder, stainless steel powder, and mixtures thereof.

Therefore, the invention as a whole would have been obvious to one of ordinary skill in the art at the time the invention was made because the disclosure of Gan et al. indicates that aluminum powder is suitable for use as a conductive material in a positive electrode. The selection of a known material based on its suitability for its intended use has generally been held to be *prima facie* obvious (MPEP §2144.07). As such, it would be obvious to use aluminum powder in addition to or in place of the carbon powder of the positive electrode of Hashimoto/Ahn.

Further, regarding the powder diameters recited in claims 2 and 3, Hashimoto teaches a copper particle diameter of 10 microns. It would be well within the skill of the art to decrease this size to 5 microns, thereby falling within the claimed range. The particle size affects characteristics such as resistance and mechanical integrity. It has been held that the discovery of

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an optimum value of a result effective variable in a known process is ordinarily within the skill of the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan Crepeau whose telephone number is (571) 272-1299. The examiner can normally be reached Monday-Friday from 9:30 AM - 6:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan, can be reached at (571) 272-1292. The phone number for the organization where this application or proceeding is assigned is (571) 272-1700. Documents may be faxed to the central fax server at (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Jonathan Crepeau  
Primary Examiner  
Art Unit 1745  
September 29, 2006